

# **Lessons Learned from the Field**

**H.Q. Construction Office  
Report**

**April 2005**

# Verifying Elevations for Constructability and Design





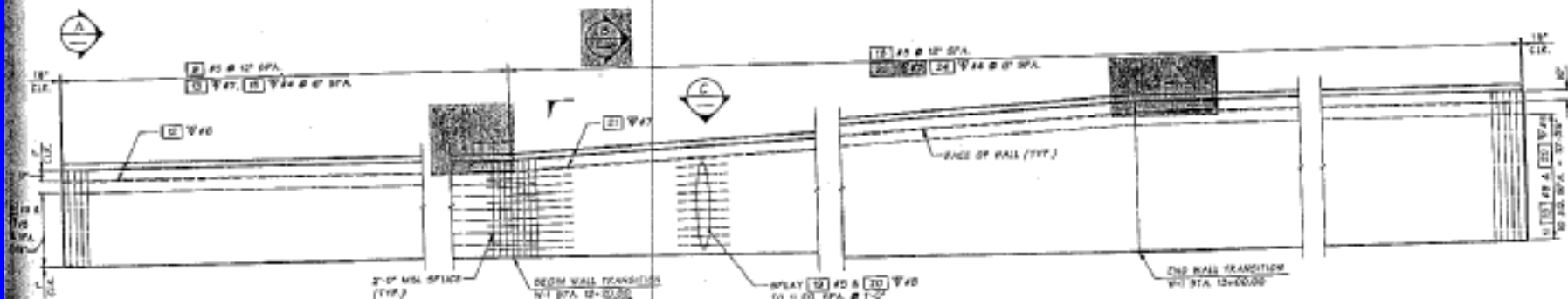
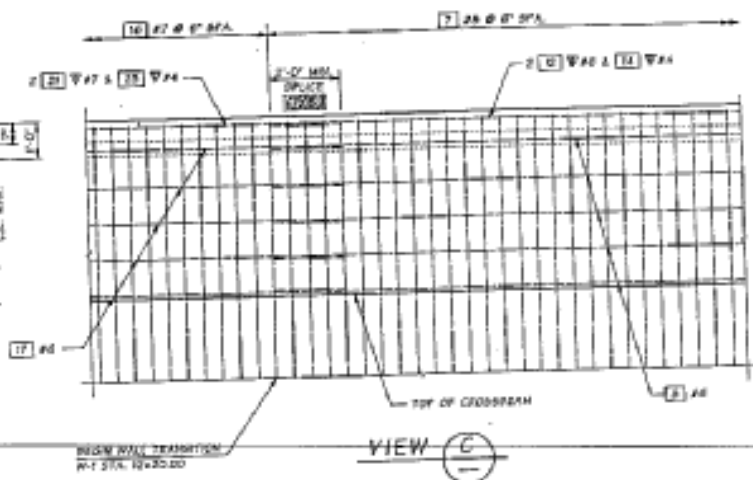
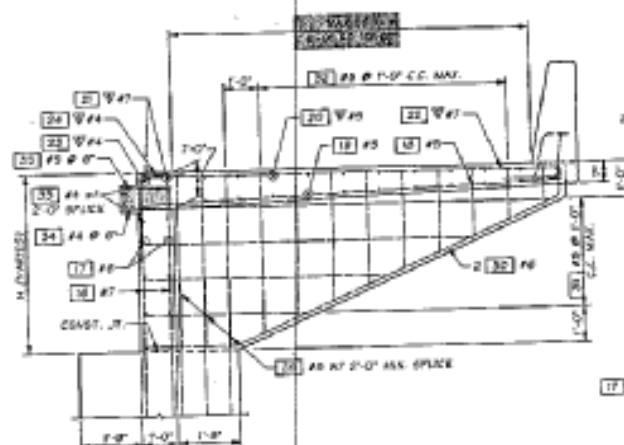
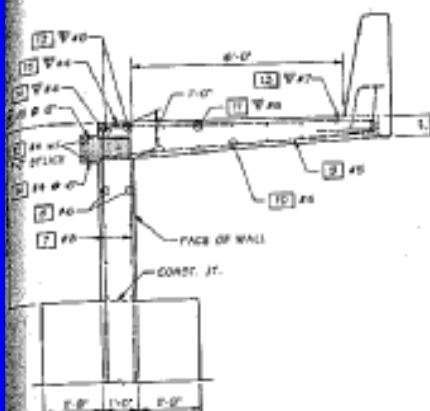










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BRIDGE  
AND  
STRUCTURES  
OFFICE

Washington State  
Department of Transportation

1-5  
SALMON CREEK TO 1-205  
TETON CREEK WALL, RD. 1

WALL DETAILS 1 OF 2





SR-18 Weyerhaeuser Way



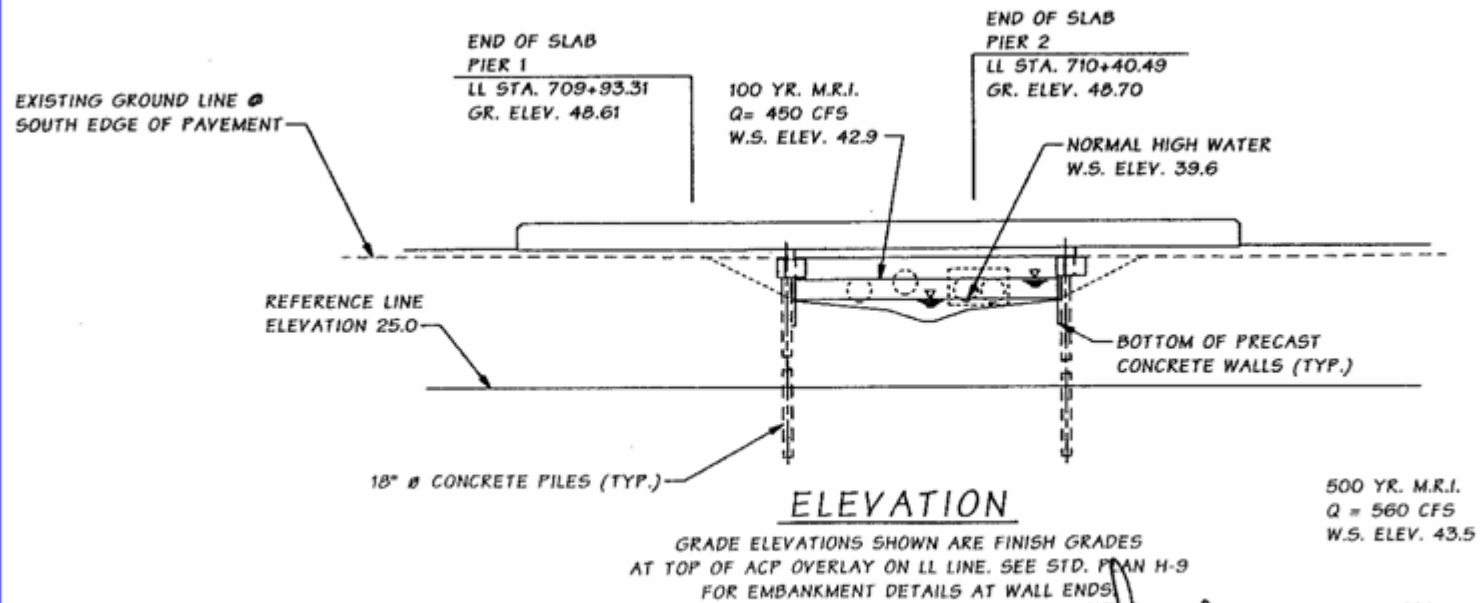




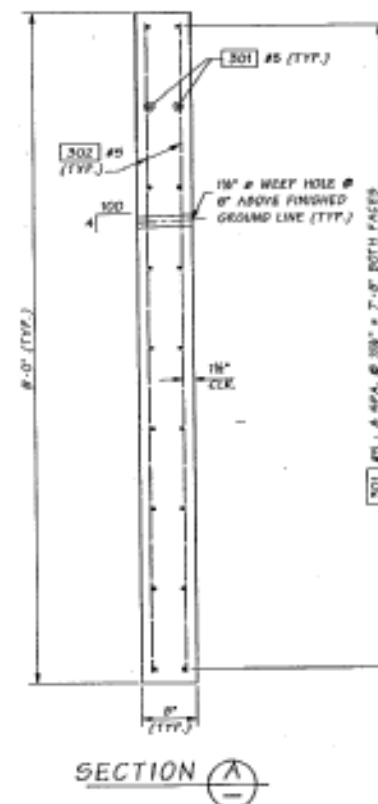
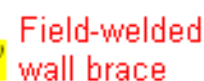
Simpson Av. Retrofit

SEP 8 2003





# I-90 Tibbetts Creek





# **Drilled Shaft/Geotechnical Issues**



SR-18 Maple  
Valley – 200<sup>th</sup>  
Street



04/30/2004













Job No.

OL-3112

SR

18

HOLE No.

TCA-7-02

PROJECT

Maple Valley to Issaquah Hobart rd.

Sheet

3

of 4

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft				SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
			10	20	30	40							
14							80/3 (80/3")		D-13		Well graded GRAVEL with sand, w/silt, subrounded, very dense, gray, moist, w/cobbles as indicated by drilling Length Recovered 0.1 ft, Length Retained 0.1 ft		
50							100/4 (100/4")		D-14		Silty SAND with gravel, very dense, gray, wet, w/cobbles as indicated by drilling process - drilled on cobble Length Recovered 0.2 ft, Length Retained 0.2 ft		
55							26 38 50 (88)		D-15		Well graded SAND, very dense, light brown, wet, material change at 53.0' as indicated by drilling process drill cuttings color change gray to brown Length Recovered 1.5 ft, Length Retained 1.5 ft		
60							39 48 50 (98)		D-16		Well graded SAND, very dense, light brown, wet Length Recovered 1.5 ft, Length Retained 1.5 ft		
65							35 39 45 (84)		D-17		Well graded SAND, very dense, light brown, wet, slight artesian pressure present approx. 3.0' head above ground Length Recovered 1.5 ft, Length Retained 1.5 ft		
20											3.0' HEAD ABOVE GROUND. WATER TABLE 13'-0" BELOW GROUND ⇒ 16'-0" ARTESIAN HEAD		
70													

SOIL MAPLE VALLEY TO ISSY HOBART ALL HOLES G.P.J. SOIL GUT 42003.3.30.18 P4

Bot of  
SHAFT  
65.4

# **Tall Abutment Walls**

## **Backfill Isolation**



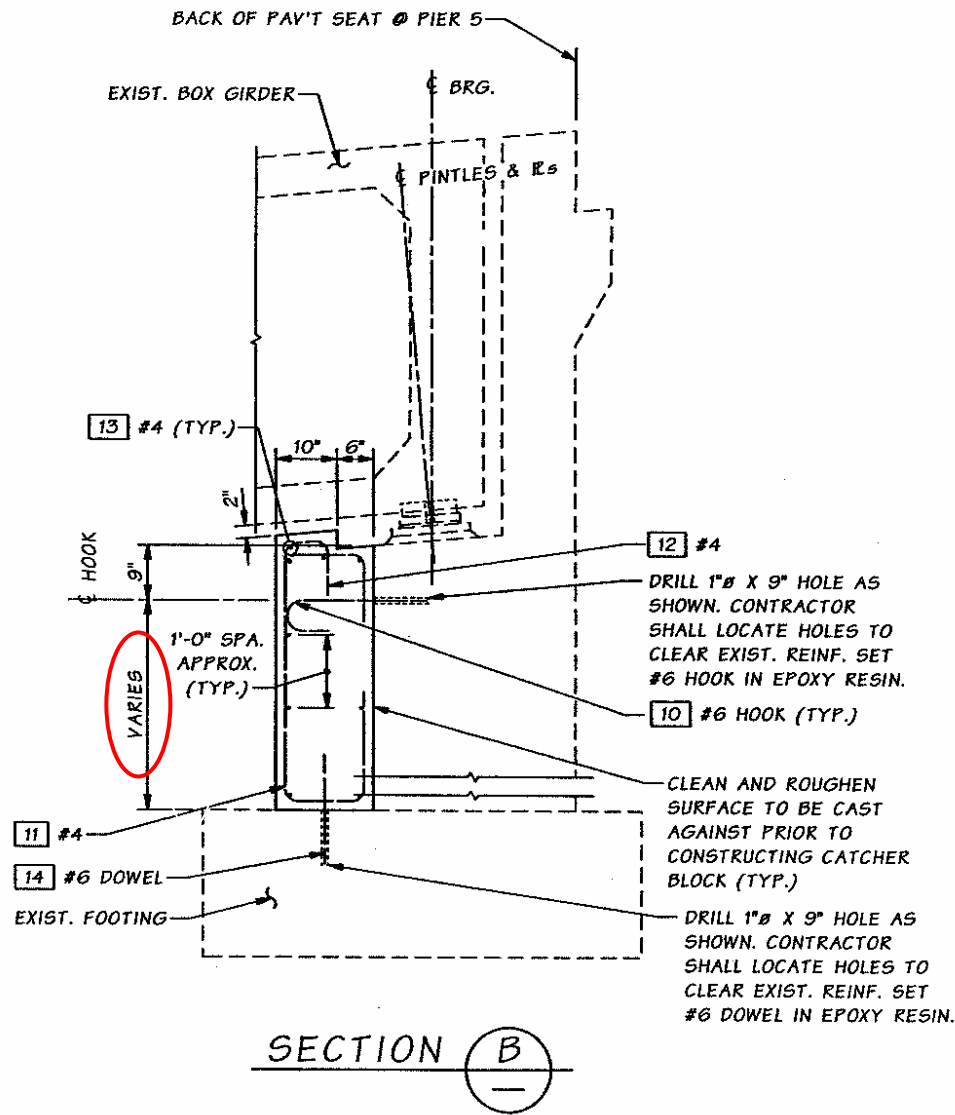








# Seismic Retrofit Details and Specifications



“Varies” is not adequately descriptive

### Recommendation

- Provide approx. dimensions
- Give estimated elevations
- Require Contractor to field-verify

North Seattle Bridges - Seismic



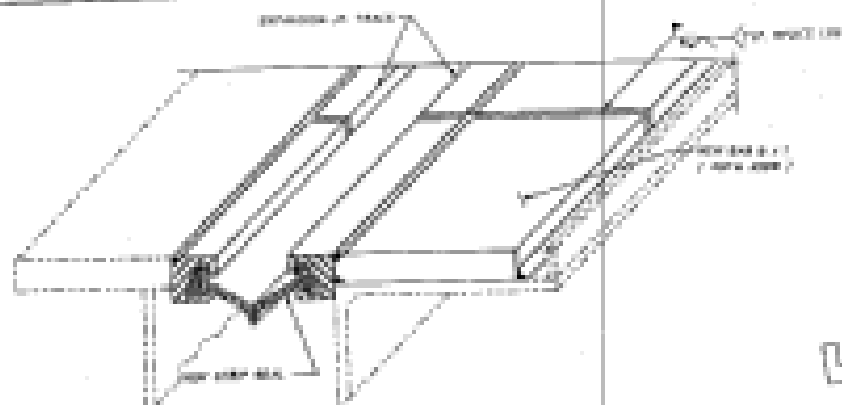


# Issues with seismic retrofit field measuring

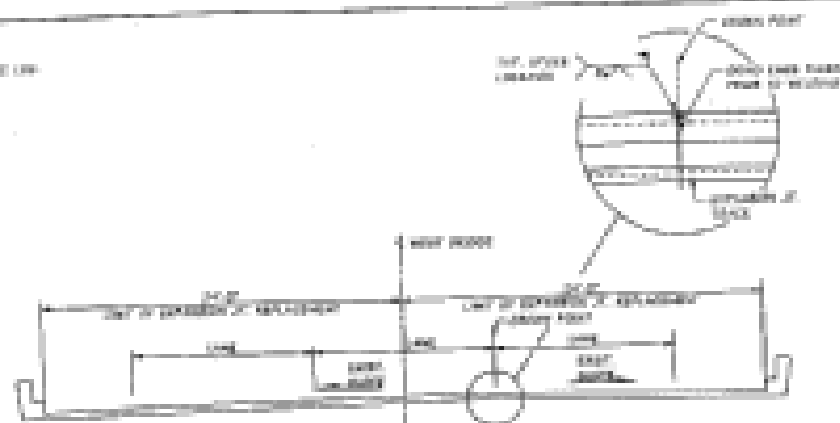
- Make lump-sum payment
  - Not incidental to seismic work
  - Not a payment per each
- Specify that results are to be incorporated into shop drawings.



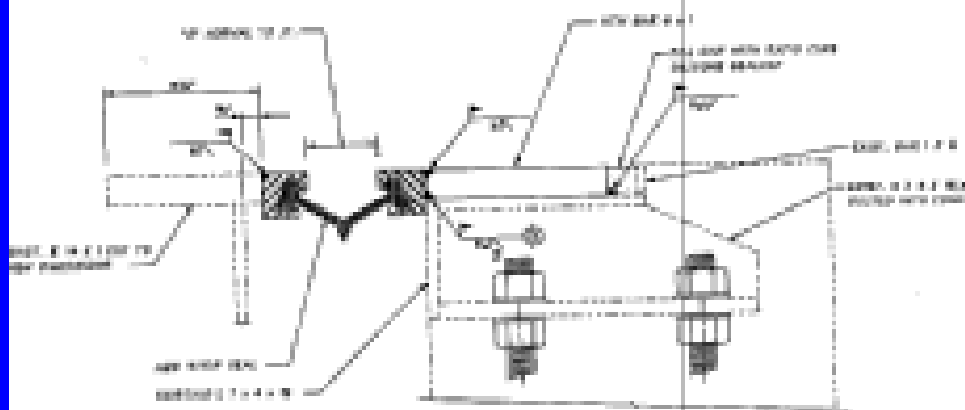
# Expansion Jt. Retrofit



**SPLICE LOCATION WELD**  
WELD BEHIND JOINT



**CROWN SPLICE LOCATION WELD**  
WELD BEHIND JOINT



**EXPANSION JOINT RETROFIT**  
WELD BEHIND JOINT  
WELD JOINT BEHIND JOINT  
WELD JOINT BEHIND JOINT  
WELD JOINT BEHIND JOINT

40

24

1/2

2-34

**4" MOTION RANGE**

ALTERNATIVES	JOINT TYPE	STRENGTH TO EXISTING (KIP)		WELD BEHIND JOINT (KIP)
		WELD	WELD	
1. 1/2" WELD	WELD BEHIND JOINT	100	100	100
2. 1/2" WELD	WELD BEHIND JOINT	100	100	100
3. 1/2" WELD	WELD BEHIND JOINT	100	100	100

**STEEL SHAPE TYPES**

ALTERNATIVES	JOINT TYPE	STRENGTH TO EXISTING (KIP)		WELD BEHIND JOINT (KIP)
		WELD	WELD	
1. 1/2" WELD	WELD BEHIND JOINT	100	100	100
2. 1/2" WELD	WELD BEHIND JOINT	100	100	100
3. 1/2" WELD	WELD BEHIND JOINT	100	100	100

NO.	DESCRIPTION	DATE	BY	CHKD.
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				



BRIDGE AND STRUCTURES OFFICE



Washington State Department of Transportation

YOLTE RIVER BRIDGE  
STRUCTURAL REPAIR  
EXPANSION JOINT RETROFIT  
WEST BRIDGE FOR 2

12













# Falsework Clearances



VEHICLES OVER  
14' HIGH MUST  
USE



RIGHT L  
MUST  
EXIT

RV Park



VEHICLES OVER  
14' HIGH  
MUST USE



Exit 7  
NE 134th St  
WSU Vancouver  
Portland Airport



LOW CLEARANCE  
0.5  
MILES  
AHEAD













# Reinforcing Congestion













# **Lack of Room For Shoring Between Stages**





# Bearing Grout Pads













10.14.2004 14:57

# Long Span Tub Girder Bridges





# Screen Drain Holes









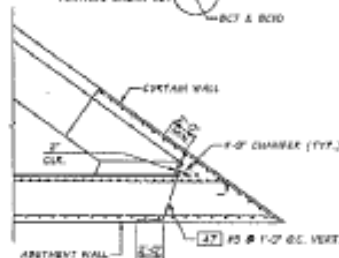
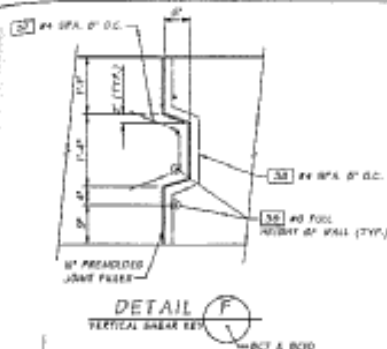




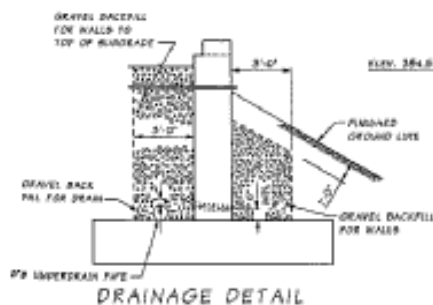
AUG 25 2004

# Details

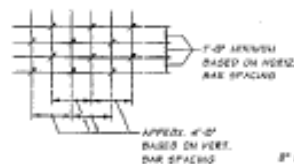




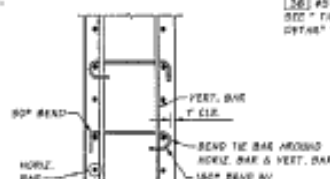
CHAMFER REINFORCING DETAIL



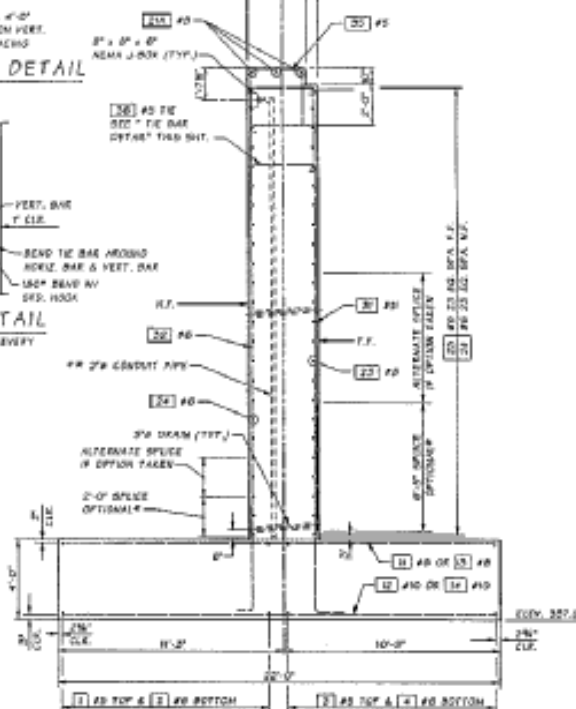
DRAINAGE DETAIL



TIE SPACING DETAIL



TIE BAR DETAIL



SECTION B  
PIER 2

SECTION A  
PIER 1

\* IF SPICE OPTION TAKEN, STAGGER SPICE IN ALTERNATING EASTERN EACH BAR  
\*\* 3\"/>

V.F. = VEER FACE  
E.F. = EAR FACE

REVISION	DATE	BY	CHKD	APPD
1	10/1/88	J. J. J.	J. J. J.	J. J. J.
2	10/1/88	J. J. J.	J. J. J.	J. J. J.
3	10/1/88	J. J. J.	J. J. J.	J. J. J.
4	10/1/88	J. J. J.	J. J. J.	J. J. J.
5	10/1/88	J. J. J.	J. J. J.	J. J. J.
6	10/1/88	J. J. J.	J. J. J.	J. J. J.
7	10/1/88	J. J. J.	J. J. J.	J. J. J.
8	10/1/88	J. J. J.	J. J. J.	J. J. J.
9	10/1/88	J. J. J.	J. J. J.	J. J. J.
10	10/1/88	J. J. J.	J. J. J.	J. J. J.

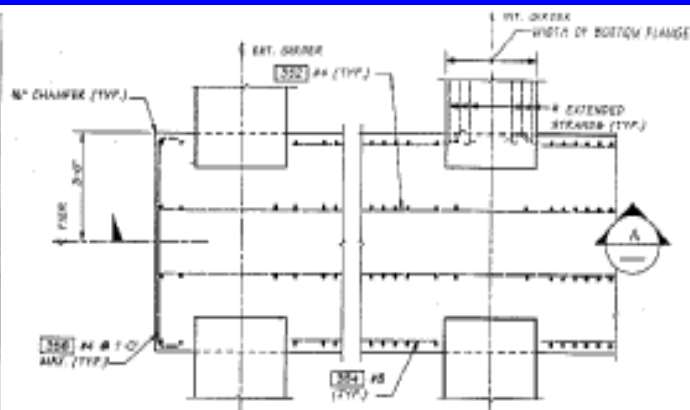


BRIDGE  
AND  
STRUCTURES  
OFFICE



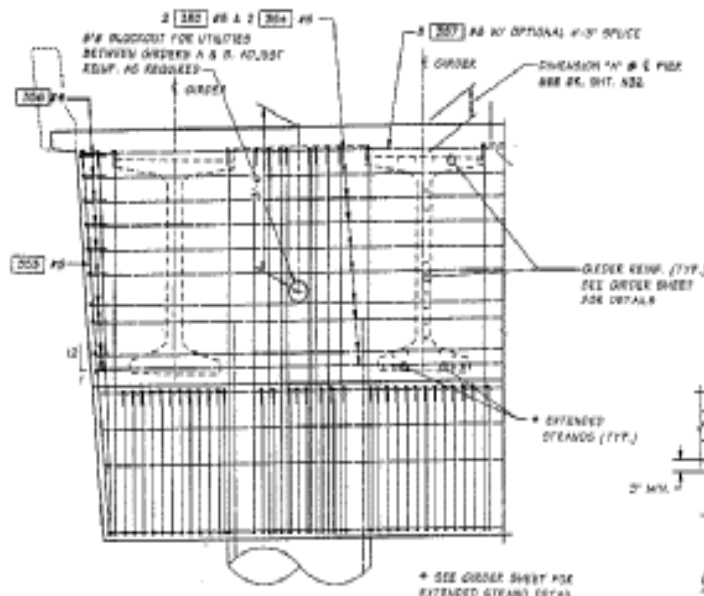
Washington State  
Department of Transportation

SR 240 1-182 to COLUMBIA CENTER VC
240/15 REPLACEMENT
ABUTMENT SECTIONS PIER 1 & PIER 2



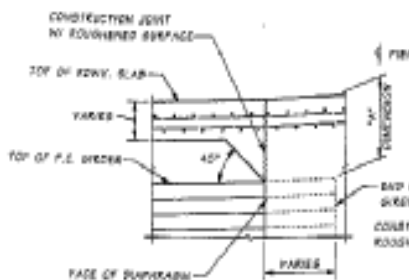
**PLAN - FIXED FLUSH-FACE DIAPHRAGM**

SEE CROSSBEAM DETAILS SHEETS FOR VERTICAL REINFORCING

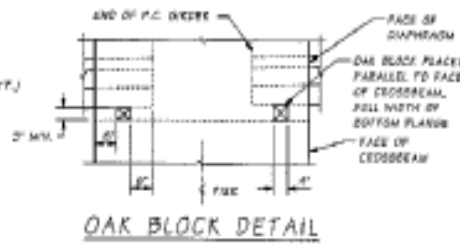


**SECTION A**

SEE CROSSBEAM DETAILS SHEET FOR VERTICAL REINFORCING



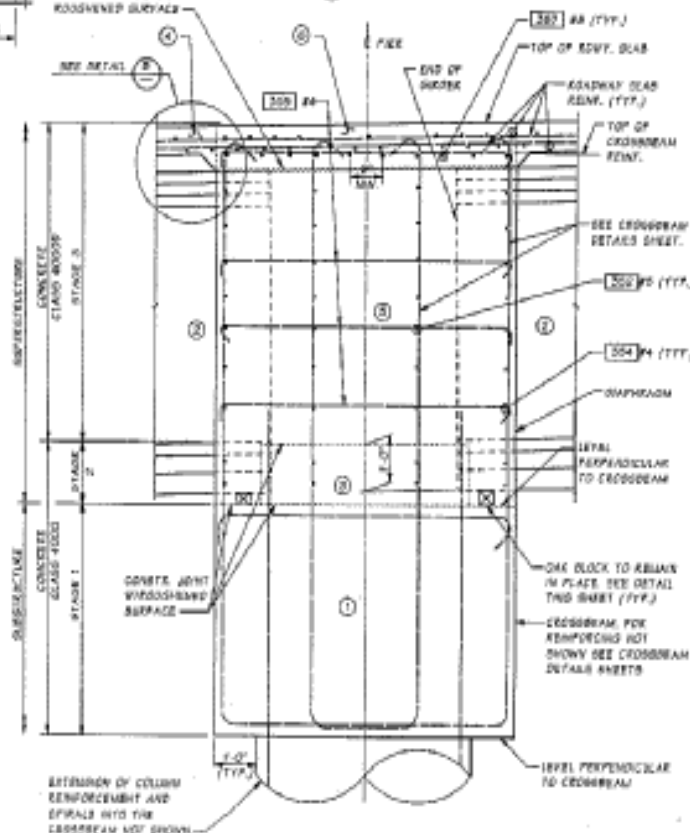
**DETAIL B**



**OAK BLOCK DETAIL**

**CONSTRUCTION SEQUENCE**

- 1 CROSSBEAM
- 2 PLACE ORDER ON BLOCKS
- 3 DIAPHRAGM STAGE 2
- 4 ROADWAY SLAB
- 5 DIAPHRAGM STAGE 1
- 6 DIAPHRAGM STAGE 3



**TYPICAL FIXED FLUSH-FACE DIAPHRAGM**

BRIDGE 240/12 N

<p>Bridge Design No. 240/12 N</p> <p>Span: 12' x 12' x 12'</p> <p>Design By: [Signature]</p> <p>Checked By: [Signature]</p> <p>Approved By: [Signature]</p> <p>Scale: 1/4\"/&gt; </p>	<p>DATE: 10/1/12</p> <p>BY: [Signature]</p> <p>FOR: [Signature]</p>	<p>12' x 12' x 12'</p> <p>12' x 12' x 12'</p> <p>12' x 12' x 12'</p>	<p>BRIDGE AND STRUCTURES OFFICE</p>	<p>Washington State Department of Transportation</p>	<p>SR 240 YAKIMA RIVER BRIDGE AT RICHLAND</p>	<p>INTERMEDIATE PIER DETAILS</p>
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MAR 4 2005

# CRIP

- **Pre-conceptual Structural Evaluation**
- **Short Review Time**
- **Merit Evaluation**



# **Traffic Restrictions During Deck Closure Placement**

**Evaluate for:**

- **Vibration From Adjacent Traffic**
- **Long Span Live Load Deflection**

# Shaft Construction Report

- Shafts constructed = 140
- Shafts with defects = 19
- Shafts repaired = 2
- Shafts rejected = 1
- FA paid / FA estimated = 16%
- Claims = \$115K



# Post-tensioned Duct Void Detection











COLLECT - FILE 021



29 3/8 in

4 7/8 in

RUN/STOP

COLLECT  
MODE

PLAYBACK  
MODE

RUN/SETUP

DISPLAY

DEPTH







5. 5. 2004 14:20













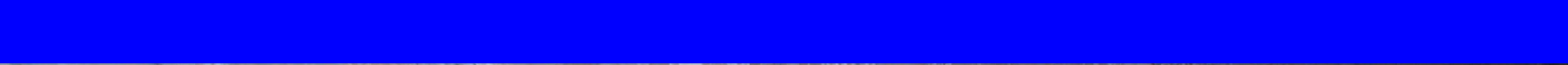






5. 7. 2004 07:54





5. 6. 2004 16:27